

### **Size dependant photosynthetic characteristic of phytoplankton in the Victoria Reservoir**

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Increasing photosynthetic rate under favourable conditions will lead trophic changes in inland water bodies and elevated phytoplanktonic primary productivity enhances fish yields. Increased herbivorous fish populations regulates hypertrophic conditions in harvesting reservoirs to greater extent but trophic evolution is unfavourable in the case of deep highland reservoirs which are not rich in grazing populations. Therefore, the knowledge on photosynthetic efficiency of different fractions of phytoplankton assemblage is important in sustainable management of reservoir systems.

In the present study it was hypothesized that smaller sized phytoplankton having higher area to volume ratio and in turn may lead to highly productive aquatic ecosystems. Photosynthetic rates of total phytoplankton assemblage and two fractions of phytoplankton (>40 $\mu$ m, <40 $\mu$ m, >20 $\mu$ m and <20 $\mu$ m) in the Victoria, the deepest reservoir in Sri Lanka were determined *in situ* by incubating light-dark bottles within the euphotic depth. Total incoming radiation (TIR), photosynthetically active radiation (PhAR) during incubation and underwater light climate were also determined. Further, water sample were analyzed for micro-nutrients and chlorophyll-a (Chl-a) concentrations. The smallest fraction of phytoplankton (<10 $\mu$ m) had the highest photosynthetic rate per unit Chl-a content. The relationship between total phosphorous, Chl-a and the nature of vertical photosynthetic profiles with least surface inhibition indicate that the Victoria reservoir whose phytoplankton assemblage dominated by a centric diatom (*Aulacoseira granualta*) and small desmids (*Straurastrum* spp) was mesotrophic during the present study.